

THE INVENTION CLAIMED IS

1. An apparatus for occluding a physical anomaly, said anomaly having an interior, comprising:

a shape memory material body for positioning in the interior of the physical anomaly, and

a system for providing said shape memory material body with a primary shape for occluding the physical anomaly and a secondary shape for being positioned in interior of the physical anomaly.

2. The apparatus of claim 1 wherein said shape memory material body comprises a shape memory polymer.

3. The apparatus of claim 1 wherein said shape memory material body comprises a shape memory polymer foam.

4. The apparatus of claim 1 wherein said shape memory material body is biodegradable.

5. The apparatus of claim 1 including a delivery catheter.

6. The apparatus of claim 1 including a delivery catheter and a guide wire.

7. The apparatus of claim 1 including a delivery catheter, a guide wire having an end, and an expandable shape memory material at said end of said guide wire.

8. The apparatus of claim 1 wherein said shape memory material body is a shape memory polymer foam and said system for providing said shape memory material body with a primary shape and a secondary shape comprises radiology.

9. The apparatus of claim 1 wherein said shape memory material body is a shape memory polymer foam and said system for providing said shape memory material body with a primary shape and a secondary shape comprises electromagnetic energy.

10. The apparatus of claim 1 wherein said shape memory material body is a shape memory polymer foam and said system for providing said shape memory material body with a primary shape and a secondary shape comprises electromagnetic energy delivered optically.

11. The apparatus of claim 1 wherein said shape memory material body is a collapsed shape memory polymer foam device connected at the end of a guide wire.

12. The apparatus of claim 1 wherein said system for providing said shape memory material body with a primary shape and a secondary shape comprises a system for optical heating using optic fibers to transport light energy to said shape memory material body.

13. The apparatus of claim 1 wherein said system for providing said shape memory material body with a primary shape and a secondary shape comprises a laser and an optical fiber wherein said laser transmits laser light through said optical fiber.

14. The apparatus of claim 1 wherein said system for providing said shape memory material body with a primary shape and a secondary shape comprises a laser and an optical fiber wherein said laser transmits laser light through a multimode optical fiber.

15. The apparatus of claim 1 wherein said system for providing said shape memory material body with a primary shape and a secondary shape comprises a light absorbing material.

16. The apparatus of claim 1 wherein said system for providing said shape memory material body with a primary shape and a secondary shape comprises a light absorbing dye in an elastomeric coating on said shape memory material body.

17. The apparatus of claim 1 wherein said system for providing said shape memory material body with a primary shape and a secondary shape comprises microparticles that convert RF radiation to heat.

18. The apparatus of claim 1 wherein said system for providing said shape memory material body with a primary shape and a secondary shape comprises microparticles of a material which can selectively absorb RF radiation converting it to heat.

19. The apparatus of claim 1 wherein said system for providing said shape memory material body with a primary shape and a secondary shape comprises nanoparticles that convert RF radiation to heat.

20. The apparatus of claim 1 wherein said system for providing said shape memory material body with a primary shape and a secondary shape comprises nanoparticles of a material which can selectively absorb RF radiation converting it to heat.

21. The apparatus of claim 1 wherein said shape memory material body comprises a shape memory polymer body with a secondary shape for being positioned in the interior of the physical anomaly and a larger primary shape for occluding the anomaly.

22. The apparatus of claim 1 wherein said shape memory material body comprises a shape memory polymer foam body having a secondary shape for being positioned in the interior of the physical anomaly and a larger primary shape for occluding the anomaly.

23. An apparatus for occluding a physical anomaly, said anomaly having an interior, comprising:

shape memory material body means for being positioned in the interior of the physical anomaly, and

activation means for providing said shape memory material body means with a primary shape for occluding the physical anomaly and a secondary shape for being positioned in interior of the physical anomaly.

24. The apparatus of claim 23 wherein said shape memory material body means comprises a shape memory polymer.

25. The apparatus of claim 23 wherein said shape memory material body means comprises a shape memory polymer foam.

26. The apparatus of claim 23 wherein said shape memory material body means is biodegradable.

27. The apparatus of claim 23 including a delivery catheter.

28. The apparatus of claim 23 including a delivery catheter and a guide wire.

29. The apparatus of claim 23 including a delivery catheter, a guide wire having an end, and an expandable shape memory material at said end of said guide wire.

30. The apparatus of claim 23 wherein said shape memory material body means is a shape memory polymer foam and said activation means for providing said shape memory material body means with a primary shape and a secondary shape comprises radiology.

31. The apparatus of claim 23 wherein said shape memory material body means is a shape memory polymer foam and said activation means for providing said shape memory material body means with a primary shape and a secondary shape comprises electromagnetic energy.

32. The apparatus of claim 23 wherein said shape memory material body means is a shape memory polymer foam and said activation means for providing

said shape memory material body means with a primary shape and a secondary shape comprises electromagnetic energy delivered optically.

33. The apparatus of claim 23 wherein said shape memory material body means is a collapsed shape memory polymer foam device connected at the end of a guide wire.

34. The apparatus of claim 23 wherein said activation means for providing said shape memory material body means with a primary shape and a secondary shape comprises a system for optical heating using optic fibers to transport light energy to said shape memory material body means.

35. The apparatus of claim 23 wherein said activation means for providing said shape memory material body means with a primary shape and a secondary shape comprises a laser and an optical fiber wherein said laser transmits laser light through said optical fiber.

36. The apparatus of claim 23 wherein said activation means for providing said shape memory material body means with a primary shape and a secondary shape comprises a laser and an optical fiber wherein said laser transmits laser light through a multimode optical fiber.

37. The apparatus of claim 23 wherein said activation means for providing said shape memory material body means with a primary shape and a secondary shape comprises a light absorbing material.

38. The apparatus of claim 23 wherein said activation means for providing said shape memory material body means with a primary shape and a secondary shape comprises a light absorbing dye in an elastomeric coating on said shape memory material body means.

39. The apparatus of claim 23 wherein said activation means for providing said shape memory material body means with a primary shape and a secondary shape comprises microparticles that convert RF radiation to heat.

40. The apparatus of claim 23 wherein said activation means for providing said shape memory material body means with a primary shape and a secondary shape comprises microparticles of a material which can selectively absorb RF radiation converting it to heat.

41. The apparatus of claim 23 wherein said activation means for providing said shape memory material body means with a primary shape and a secondary shape comprises nanoparticles that convert RF radiation to heat.

42. The apparatus of claim 23 wherein said activation means for providing said shape memory material body means with a primary shape and a secondary shape comprises nanoparticles of a material which can selectively absorb RF radiation converting it to heat.

43. The apparatus of claim 23 wherein said shape memory material body means comprises a shape memory polymer body with a secondary shape for being positioned in the interior of the physical anomaly and a larger primary shape for occluding the anomaly.

44. The apparatus of claim 23 wherein said shape memory material body means comprises a shape memory polymer foam body having a secondary shape for being positioned in the interior of the physical anomaly and a larger primary shape for occluding the anomaly.

45. A method for occluding a physical anomaly, the physical anomaly having an interior, comprising the steps of:

providing a shape memory material body with a secondary shape for being positioned in the interior of the physical anomaly and a larger primary shape for occluding the anomaly,

positioning said shape memory material body in the interior of the physical anomaly when said shape memory material body is in said secondary shape, and

causing said closure body to change to said larger primary shape for occluding the anomaly.

46. The method of claim 45 wherein said step of providing a shape memory material body with a secondary shape for being positioned in the interior of the physical anomaly and a larger primary shape for occluding the anomaly comprises providing a shape memory polymer foam body with a secondary shape for being positioned in the interior of the physical anomaly and a larger primary shape for occluding the anomaly.

47. The method of claim 45 wherein said step of positioning said shape memory material body in the interior of the physical anomaly when said shape memory material body is in said secondary shape is accomplished using a catheter.

48. The method of claim 45 wherein said step of providing a shape memory material body with a secondary shape for being positioned in the interior of the physical anomaly and a larger primary shape for occluding the anomaly comprises delivering electromagnetic energy optically to said shape memory material body.

49. The method of claim 45 wherein said step of providing a shape memory material body with a secondary shape for being positioned in the interior of the physical anomaly and a larger primary shape for occluding the

anomaly comprises using a collapsed shape memory polymer foam device connected at the end of a guide wire.

50. The method of claim 45 wherein said step of providing a shape memory material body with a secondary shape for being positioned in the interior of the physical anomaly and a larger primary shape for occluding the anomaly comprises optical heating said shape memory material body.

51. The method of claim 45 wherein said step of providing a shape memory material body with a secondary shape for being positioned in the interior of the physical anomaly and a larger primary shape for occluding the anomaly comprises optical heating said shape memory material body through optic fibers.

52. The method of claim 45 wherein said step of providing a shape memory material body with a secondary shape for being positioned in the interior of the physical anomaly and a larger primary shape for occluding the anomaly comprises using a laser and an optical fiber to transmit laser light through said optical fiber.

53. The method of claim 45 wherein said step of providing a shape memory material body with a secondary shape for being positioned in the interior of the physical anomaly and a larger primary shape for occluding the anomaly comprises using microparticles that convert RF radiation to heat.

54. The method of claim 45 wherein said step of providing a shape memory material body with a secondary shape for being positioned in the interior of the physical anomaly and a larger primary shape for occluding the anomaly comprises using microparticles of a material which can selectively absorb RF radiation converting it to heat.



55. The method of claim 45 wherein said step of providing a shape memory material body with a secondary shape for being positioned in the interior of the physical anomaly and a larger primary shape for occluding the anomaly comprises using nanoparticles that convert RF radiation to heat.

56. The method of claim 45 wherein said step of providing a shape memory material body with a secondary shape for being positioned in the interior of the physical anomaly and a larger primary shape for occluding the anomaly comprises using nanoparticles of a material which can selectively absorb RF radiation converting it to heat.